Section 635
Issue No. 3
Addendum No. 2
October 1966

CONSTRUCTION OF AERIAL CABLE PLANT

Purpose: This addendum is issued to supplement Section 635 with revised information relative to the construction of Figure 8 cable plant. It replaces Addendum No. 1.

Additions:

2. HANDLING AND STORAGE OF CABLE

2.02 Figure 8 cable should be handled and stored in such a manner as to prevent physical damage. The ends of the cable on the reel should be adequately sealed to prevent moisture entering the cable core or the interstices of the supporting strand.

3. STRINGING OF CABLE

3.12 Guying shall be completed in the section of line before Figure 8 cable stringing begins.

3.13 Figure 8 cable should be placed from a moving reel whenever possible. It should be placed in stringing blocks on the poles where it should remain during the remainder of the placing and tensioning operations.

3.14 Where it is necessary, because of physical obstructions, to pull in the Figure 8 cable from a stationary reel, the cable should be run through stringing blocks under a sufficient amount of tension to avoid excessive bending and to prevent the cable contacting the ground or obstructions between poles. Care should be exercised to prevent continuous spiralings occurring in Figure 8 cable when strung from a stationary reel. Since the cable is spiraled by hand from alternate poles after it is tensioned, any existing spirals would be increased in one span and removed in the adjacent span. It would then be very difficult to obtain a uniform number of spirals in every span.

4. STRAND SPLICES

4.02 Reel end splices in the Figure 8 cable's support strand shall be made during the placing operation by means of insulated automatic type splicing sleeves. It is important that only enough insulation be removed from the support member to properly install the splicing sleeve. A sufficient amount of overlap of the jacketed conductors should be provided to permit splicing of the cable in a ready-access enclosure. The free ends of the jacketed conductors should be temporarily taped to the undisturbed portion of the Figure 8 cable before proceeding with the placing operations. The cable can thus be tensioned and spiraled before the cable conductors are spliced.

5. TENSIONING OF CABLE

5.08 Figure 8 cable may be tensioned with the aid of series dynamometer, weights, or sagged by the target method. The cable should be temporarily supported at each pole in stringing blocks until after the cable has been tensioned and the tension equalized in all spans of the section being tensioned. Tension should be applied slowly while the entire length of cable being pulled is observed for evidence of snagging or failure to move freely through its temporary supports at the poles.

5.09 The initial stringing tension for Figure 8 cable depends upon the size of its support strand, the size of the cable core, the storm loading district involved, the maximum permissible span length and the temperature at the time of tensioning.

5.10 Tables 1a through 6a show the stringing sags and tensions to be used for the various size cables supported by a 3/16-inch EHS 7-wire galvanized steel strand. Tables 7a through 10a are for cable supported by the 1/4-inch EHS 7-wire galvanized steel strand. These tables contain sag and tension data for all three loading districts. The loading district to which each temperature applies is shown to the left of the temperatures.

5.11 Each table also contains a different tension for each 100 foot interval of span length. The tension to be used is that shown immediately below the sag at a given temperature for the maximum span in the pulling section. For example, assume that a 50-pair, 22-gauge Figure 8 cable supported by a 1/4-inch EHS stranded messenger is to be used in the Medium Loading District. Table 7a would be consulted to determine the initial sag and tension values. Also assume that the temperature during the tensioning operation is 75°F. and that the span lengths in the pulling section range from 275 feet to 350 feet. From Table 7a, the stringing tension to be applied for this pulling section is 1,562 pounds.

5.12 The cable sizes appearing on each Table in this addendum are as follows:

3/16" Support Strand		1/4" Support Strand	
Table 1a	6/24	Table 7a	25/19 50/22 75/24
Table 2a	6/22 12/24	Table 8a	75/22 100/24
Table 3a	6/19 12/22 18/24	Table 9a	50/19 100/22 150/24
Table 4a	18/22 25/24	Table 10a	75/19 200/24
Table 5a	12/19 25/22		
Table 6a	18/19 50/24		

5.13 One method successfully employed by some contractors for tensioning Figure 8 cable is illustrated by Figure 13. With this method four or five cable spans are tensioned at a time by fastening the tensioning device to the base of the next pole. As the tension applied in the next pulling section of cable approaches the tension in the first section, the tensioning device at the base of the pole slacks off and the tensioning grip can be removed from the support member of the cable. The cable is then taken up the pole and placed in the supporting hardware on the pole. The sag in the adjacent spans may be affected to some degree when the cable is taken up the pole. This may result in about 3 inches increased sag in a 300-foot span. This amount of increased sag for cable is negligible. Usually when this method is employed, the need for temporary guys is eliminated.

5.14 When tensioning Figure 8 cable, it is important that the insulation over the support strand is not damaged. Tensioning by means of grips placed over the insulated support wire or strand is preferred, providing that this can be accomplished without rupturing the insulation. The Crescent Tool Company's No. 800 insulated wire grip, or equivalent, has been found to be suitable for this purpose.

10 CABLE SPLICING

X6 Splicing of Figure 8 cable and mounting of the splice enclosure should be performed in accordance with the REA Splicing Standard PC-2. Ready-access enclosures are used for splices.

TERMINALS

11.04 When ready-access enclosures are installed on Figure 8 cable for the purpose of mounting a terminal block, it will usually require the use of a strand jack or slack puller to relieve the tension on the cable conductors in order to make the necessary tap connections.

15. PREVENTION OF CABLE DANCING

15.07 Because of the configuration of the Figure 8 cable, it will probably be as susceptible to dancing as conventional lashed aerial cable. Therefore it should be spiraled in each span at the time of installation as shown on Guide Drawing 250-1 of the REA Form 511.

15.08 Experience has shown that spiraling is generally effective in reducing the dancing of Figure 8 cable. However, occasionally the conditions may be such that spiraling alone will not eliminate the cable dancing. In such cases it is advisable to construct a catenary by installing a 6M suspension strand approximately two feet above the Figure 8 cable to divide the one span essentially into three or four unequal spans. The cable should still be spiraled in the catenary.

16. PRECAUTIONS

16.09 As a safety measure, the support strand of the Figure 8 cable should <u>not</u> be used to support a platform or a ladder. The Figure 8 cable should <u>not</u> be ridden with a cable car.

TABLE 1a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 3/16-inch EHS Stranded Messenger. This Table applies to the following size:

6 Pr. 24 Ga.

ading District	Temperature °F					
avy.	-30	0	30	60	90	120
dium	-15	15	45	75	105	
ight.	0	30	60	90	120	
an Length - Feet	Initial Sag in inches and (Initial Tension in Pounds)					
100	3	3	3	4	4	4
125	4	4	5	5	6	7
150	6	6	7	7	8	9
175	8	8	9	10	11	12
200	10	11	12	13	14	16
(Tension)	(1037)	(961)	(877)	(800)	(719)	(638)
225	13	14	15	16	18	20
250	15	17	18	20	22	24
275	19	20	22	24	26	29
300	22	24	26	28	31	34
(Tension)	(1033)	(961)	(885)	(812)	(738)	(668)
325	26	28	30	33	36	39
350	30	32	35	38	41	45
375	34	37	40	43	47	51
400	39	42	45	49	53	58
(Tension)	(1028)	(961)	(892)	(825)	(760)	(698)
425	44	47	51	55	59	64
450	50	53	57	61	66	
475	55	59	[illegible]	68	73	
500*	61	65				
(Tension)	(1024)	(961)				
525	67	72				
550	74	79				
575	81	86				
600**	88	94				
(Tension)	(1019)	(96				

*Maximum Span Heavy Loading Distric

**Will Develop 51% Loaded Tension i
Tension in Light Loading District

TABLE 2 a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 3/16-inch EHS Stranded Messenger. This Table applies to the following sizes:

6 Pr.	22 Ga.
12 Pr.	24 Ga.

Loading District	Temperature °F.					
Heavy.	-30	0	30	60	90	120
Medium.	-15	15	45	75	105	
Light	0	30	60	90	120	

Span Length - Feet	Initial Sag in inches and (Initial Tension in Pounds)					
100	3	3	4	4	5	5
125	5	5	6	6	7	8
150	7	7	8	9	10	11
175	9	10	10	11	13	14
200	11	12	14	15	16	18
(Tension)	(1042)	(961)	(879)	(802)	(723)	(647)
225	14	16	17	18	20	23
250	18	19	21	23	25	28
275	21	23	25	27	30	33
300	25	27	30	32	35	38
(Tension)	(1033)	(961)	(887)	(818)	(749)	(682)
325	30	32	35	37	41	44
350	35	37	40	43	47	51
375	40	43	46	49	53	58
400	45	48	52	56	60	65
(Tension)	(1025)	(961)	(896)	(835)	(774)	(716)
425	[illegible]	55	58	63	67	72
450	58	61	65	70	75	80
475*	64	68	73	77	83	88
500	71	75	80	86	91	
(Tension)	(1022)	(961)	(902)	(845)	(792)	
525	78	83	88	94	100	
550	86	91	97	103	109	
575	94	100	105	112	119	
600**	103	108	115	121	128	
(Tension)	(1014)	(961)	(910)	(860)	(813)	

*Maximum Span Heavy Loading District (Will Develop 60% Loaded Tension)
**Will Develop 52% Loaded Tension in Medium Loading District and 44% Loaded Tension in Light Loading District.

TABLE 3a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 3/16-inch EHS Stranded Messenger. This Table applies to the following sizes:

6 Pr.	19 Ga.
12 Pr.	22 Ga.
18 Pr.	24 Ga.

ading District	Temperature °F.					
avy.	-30	0	30	60	90	120
lium	-15	15	45	75	105	
ght	0	30	60	90	120	
an Length - Feet	**Initial Sag in inches and (Initial Tension in Pounds)**					
100	4	4	4	5	5	6
125	5	6	6	7	8	9
150	8	8	9	10	11	12
175	10	11	12	13	14	16
200	13	14	15	17	19	21
(Tension)	(1041)	(961)	(884)	(807)	(731)	(658)
225	17	18	19	21	23	26
250	20	22	24	26	28	31
275	25	26	29	31	34	37
300	29	31	34	37	40	43
(Tension)	(1028)	(961)	(892)	(825)	(760)	(698)
325	35	37	40	43	46	50
350	40	43	46	49	53	57
375	46	49	52	56	60	65
400	52	56	59	63	68	73
(Tension)	(1020)	(961)	(901)	(844)	(788)	(735)
425	59	63	67	71	76	81
450*	66	70	72	79	84	90
475	74	78	83	88	94	
500	82	87	92	97	103	
(Tension)	(1016)	(961)	(908)	(857)	(808)	
525	91	96	101	107	113	
550	100	105	111	117	123	
575	109	115	121	127	134	
600**	119	125	131	138	145	
(Tension)	(1008)	(961)	(916)	(872)	(830)	

*Maximum Span Heavy Loading District (Will Develop 60% Loaded Tension)

**Will Develop 53% Loaded Tension in Medium Loading District and 45% Loaded Tension in Light Loading District.

TABLE 4a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 3/16-inch EHS Stranded Messenger. This Table applies to the following sizes:

18 Pr.	22 Ga.
25 Pr.	24 Ga.

Loading District	Temperature °F					
Heavy.	-30	0	30	60	90	120
Medium	-15	15	45	75	105	
Light.	0	30	60	90	120	
Span Length - Feet	**Initial Sag in Inches and (Initial Tension in Pounds)**					
100	4	4	5	5	6	7
125	6	7	7	8	9	10
150	9	9	10	11	12	14
175	12	13	14	15	17	18
200	15	16	18	19	21	23
(Tension)	(1033)	(961)	(886)	(814)	(742)	(670)
225	19	21	22	24	26	29
250	24	25	27	30	32	35
275	29	31	33	36	39	42
300	34	37	39	42	45	49
(Tension)	(1026)	(961)	(897)	(834)	(774)	(716)
325	40	43	46	49	53	56
350	47	50	53	56	60	65
375	54	57	60	64	68	73
400	61	65	69	73	77	82
(Tension)	(1016)	(961)	(907)	(854)	(805)	(757)
425*	69	73	77	82	86	92
450	77	82	86	91	97	
475	87	91	96	101	107	
500	96	101	106	112	117	
(Tension)	(1009)	(961)	(914)	(869)	(826)	
525	106	111	117	122	128	
550	117	122	128	134	140	
575	128	133	139	146	152	
600**	139	145	151	158	165	
(Tension)	(1002)	(961)	(922)	(885)	(848)	

*Maximum Span Heavy Loading District (Will Develop 60% Loaded Tension)
**Will Develop 53% Loaded Tension in Medium Loading District and 46% Loaded Tension in Light Loading District.

TABLE 5a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 3/16-inch EHS Stranded Messenger. This Table applies to the following sizes:

12 Pr.	19 Ga.
25 Pr.	22 Ga.

Loading District	Temperature °F.					
Heavy.	-30	0	30	60	90	120
Medium	-15	15	45	75	105	
Light.	0	30	60	90	120	
Span Length - Feet	**Initial Sag in inches and (Initial Tension in Pounds)**					
100	5	5	5	6	7	7
125	7	8	8	9	10	11
150	10	11	12	13	14	15
175	13	14	16	17	19	20
200	17	19	20	22	24	26
(Tension)	(1034)	(961)	(889)	(820)	(751)	(684)
225	22	24	25	27	30	32
250	27	29	31	33	36	39
275	33	35	37	40	43	46
300	39	42	44	47	51	54
(Tension)	(1021)	(961)	(901)	(843)	(788)	(735)
325	46	49	52	55	59	63
350	53	56	60	63	67	72
375	61	65	68	72	77	81
400	70	74	78	82	86	91
(Tension)	(1010)	(961)	(912)	(865)	(820)	(777)
425*	79	83	87	92	97	102
450	89	93	98	103	108	
475	99	104	109	114	119	
500	110	115	120	126	131	
(Tension)	(1004)	(961)	(920)	(880)	(842)	
525	122	127	132	138	144	
550	134	139	145	151	157	
575	147	152	158	164	170	
600**	160	166	172	178	185	
(Tension)	(996)	(961)	(928)	(895)	(864)	

*Maximum Span Heavy Loading (Will Develop 60% Loaded Tension)

**Will Develop 54% Loaded Tension in Medium Loading District and 47% Loaded Tension in Light Loading District.

TABLE 6a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 3/16-inch EHS Stranded Messenger. This Table applies to the following sizes:

18 Pr.	19 Ga.
50 Pr.	24 Ga.

ading District	Temperature °F.					
avy	-30	0	30	60	90	120
dium.	-15	15	45	75	105	
ght.	0	30	60	90	120	
an Length - Feet	**Initial Sag in inches and (Initial Tension in Pounds)**					
100	6	6	6	7	8	9
125	8	9	10	11	12	13
150	12	13	14	15	17	18
175	16	18	19	20	22	24
200	21	23	24	26	28	31
(Tension)	(1028)	(961)	(894)	(830)	(767)	(707)
225	27	29	31	33	35	38
250	33	35	38	40	43	46
275	40	43	45	48	51	55
300	48	51	54	57	60	64
(Tension)	(1014)	(961)	(908)	(858)	(810)	(764)
325	57	60	63	66	70	74
350	66	69	73	76	80	84
375	76	79	83	87	91	95
400	86	90	94	98	103	107
(Tension)	(1002)	(961)	(920)	(881)	(843)	(807)
425*	98	102	106	110	115	120
450	110	114	119	123	128	
475	122	127	132	137	142	
500	136	141	146	151	156	
(Tension)	(995)	(961)	(929)	(897)	(866)	
525	150	155	160	166	171	
550	165	170	176	181	187	
575	181	186	192	197	203	
600**	197	203	209	214	220	
(Tension)	(988)	(961)	(935)	(910)	(886)	

*Maximum Span Heavy Loading District (Will Develop 60% Loaded Tension)

**Will Develop 54% Loaded Tension in Medium Loading District and 47% Loaded Tension in Light Loading District.

TABLE 7 a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 1/4-inch EHS Stranded Messenger. This table applies to the following sizes:

25 Pr.	19 Ga.
50 Pr.	22 Ga.
75 Pr.	24 Ga.

Loading District	Temperature °F					
Heavy...........	-30	0	30	60	90	120
Medium..........	-15	15	45	75	105	
Light...........	0	30	60	90	120	
Span Length - Feet	Initial Sag in inches and (Initial Tension in Pounds)					
100	5	5	5	6	6	7
125	7	8	8	9	10	11
150	10	11	12	13	14	15
175	13	14	16	17	18	20
200	18	19	20	22	24	26
(Tension)	(1845)	(1729)	(1604)	(1485)	(1367)	(1247)
225	22	24	25	27	29	32
250	27	29	31	33	36	39
275	33	35	37	40	43	46
300	39	42	44	47	50	54
(Tension)	(1831)	(1729)	(1625)	(1526)	(1428)	(1333)
325	46	49	52	55	58	62
350	54	56	60	63	67	71
375	62	65	68	72	76	81
400	70	74	78	82	86	91
(Tension)	(1813)	(1729)	(1644)			
425	80	83				
450	89	93				
475	100	104				
500	111	115				
(Tension)	(1798)	(1729)				
525	122	127				
550	134	139				
575	147	152				
600*	160	166				
(Tension)	(1785)	(1729)				

*Will Develop 58% Loaded Tension in Heavy Lo
in Medium Loading District and 42% Loade

TABLE 8 a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 1/4-inch EHS Stranded Messenger. This table applies to the following sizes:

75 Pr.	22 Ga.
100 Pr.	24 Ga.

Loading District	Temperature °F.					
Heavy...........	-30	0	30	60	90	120
Medium..........	-15	15	45	75	105	
Light...........	0	30	60	90	120	
Span Length - Feet	**Initial Sag in inches and (Initial Tension in Pounds**					
100	6	6	7	7	8	9
125	9	9	10	11	12	13
150	12	13	14	15	17	18
175	17	18	19	20	22	24
200	22	23	25	26	28	31
(Tension)	(1837)	(1729)	(1616)	(1506)	(1396)	(1289)
225	27	29	31	33	35	38
250	34	36	38	40	43	46
275	41	43	46	48	51	55
300	49	51	54	57	60	64
(Ten: on)	(1818)	(1729)	(1639)	(1552)	(1467)	(1386)
325	57	60	63	66	70	74
350	67	70	73	77	80	84
375	77	80	84	87	91	96
400	87	91	95	99	103	108
(Tension)	(1799)	(1729)	(1659)	(1591)	(1525)	(1461)
425	99	103	107	111	115	120
	111	115	119	124	129	133
	124	128	133	137	142	147
	138	142	147	152	157	162
'ension)	(1784)	(1729)	(1674)	(1620)	(1569)	(1518)
	152	157	162	167	172	177
	167	172	177	182	188	193
	183	188	193	199	204	210
	200	205	210	216	221	227
'ension)	(1772)	(1729)	(1685)	(1643)	(1601)	(1561)

elop 58% Loaded Tension in Heavy Loading District, 47% Loaded Tension
dium Loading District and 43% Loaded Tension in Light Loading District.

TABLE 9 a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 1/4-inch EHS Stranded Messenger. This Table applies to the following sizes:

50 Pr.	19 Ga.
100 Pr.	22 Ga.
150 Pr.	24 Ga.

Loading District	Temperature °F.					
Heavy...........	-30	0	30	60	90	120
Medium..........	-15	15	45	75	105	
Light...........	0	30	60	90	120	
Span Length - Feet	**Initial Sag in inches and (Initial Tension in Pounds)**					
100	7	8	8	9	10	11
125	11	12	13	13	15	16
150	16	17	18	19	21	22
175	21	22	24	26	27	29
200	28	29	31	33	35	37
(Tension)	(1826)	(1729)	(1628)	(1531)	(1437)	(1345)
225	35	37	39	41	44	46
250	43	45	48	50	53	56
275	53	55	58	60	63	67
300	63	65	68	71	75	78
(Tension)	(1801)	(1729)	(1655)	(1585)	(1516)	(1450)
325	74	77	80	83	87	90
350	86	89	92	96	99	103
375	99	102	106	109	113	117
400	113	116	120	124	128	132
(Tension)	(1782)	(1729)	(1675)	(1623)	(1572)	(1523)
425	128	131	135			
450	143	147	151			
475	160	164	168			
500	178	182	186			
(Tension)	(1768)	(1729)	(1689)			
525	197	201	205			
550	216	220	225			
575	237	241	246			
600*	258	263	268			
(Tension)	(1758)	(1729)	(1699)			

*Will Develop 59% Loaded Tension in Heavy Loading Dis
in Medium Loading District and 43% Loaded Tension

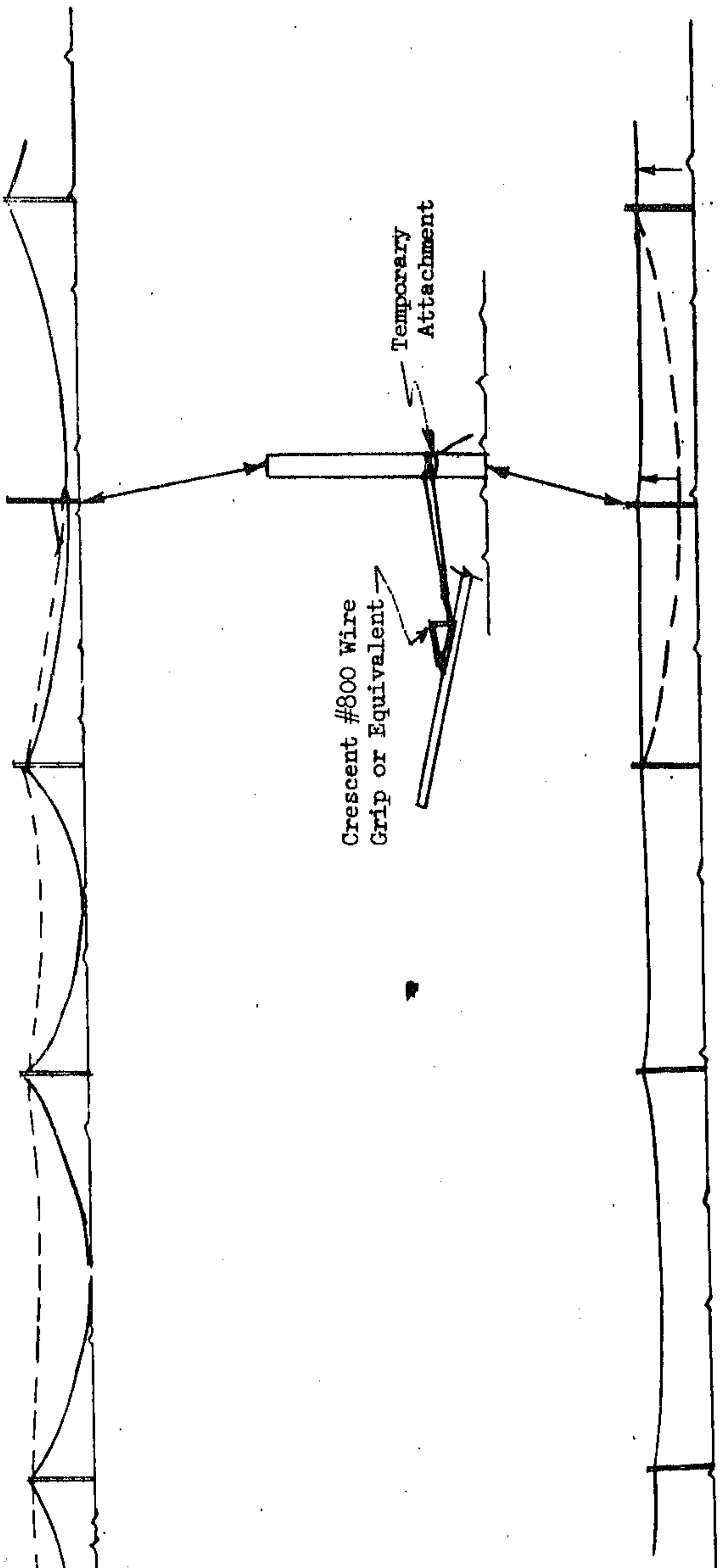
TABLE 10a

Initial Stringing Sag and Tension Data for Figure 8 Cables Supported by a 1/4-inch EHS Stranded Messenger. This table applies to the following sizes:

75 Pr.	19 Ga.
200 Pr.	24 Ga.

Loading District	Temperature °F.					
Heavy............	-30	0	30	60	90	120
Medium..........	-15	15	45	75	105	
Light............	0	30	60	90	120	
Span Length - Feet	**Initial Sag in inches and (Initial Tension in Pounds)**					
100	9	10	10	11	12	13
125	14	15	16	17	18	20
150	20	21	22	24	25	27
175	27	28	30	32	34	36
200	35	37	39	41	43	46
(Tension)	(1813)	(1729)	(1644)	(1563)	(1483)	(1406)
225	45	47	49	51	54	56
250	56	58	60	63	65	68
275	67	70	73	75	78	81
300	81	83	86	89	92	95
(Tension)	(1785)	(1729)	(1672)	(1617)	(1564)	(1511)
325	95	98	101	104	107	110
350	110	113	116	120	123	127
375	127	130	133	137	140	144
400	145	148	152	155	159	163
(Tension)	(1767)	(1729)	(1690)	(1652)	(1615)	(1578)
425	164	167	171	175	178	182
450	184	188	191	195	199	203
475	206	209	213	217	221	225
500	229	232	236	240	244	248
(Tension)	(1755)	(1729)	(1701)	(1674)	(1647)	(1621)
525	253	257	260	264	269	273
550	278	282	286	290	294	298
575	305	309	313	317	321	325
600*	333	337	341	345	349	354
(Tension)	(1748)	(1729)	(1709)	(1689)	(1669)	(1649)

*Will Develop 58% Loaded Tension in Heavy Loading District, 46% Loaded Tension in Medium Loading District and 42% Loaded Tension in Light Loading District.



TENSIONING FIGURE 8 CABLE

FIGURE 13

Section 635
Issue No. 3
February 1962

CONSTRUCTION OF AERIAL CABLE PLANT

Contents

1. GENERAL

1.01 This section is intended to provide REA borrowers, consulting engineers, contractors and other interested parties with technical information for use in the design and construction of REA borrowers' telephone systems. It discusses in particular the construction of aerial cable plant.

1.02 This section replaces REA TE & CM-635, Issue No. 2, dated June 1956. The revision suggests methods for proper storage and handling of suspension strand; provides new data on strand stringing tensions; suggests precautions in construction work; and includes recent changes in construction practices.

1.03 Aerial cable in new plant and extensions to existing plant preferably should be lashed to the suspension strand whether it is lead or polyethylene sheathed.

Reprinted 1/64

1.04 Herein it is assumed that the cable is to be lashed to the suspension strand and that the cable plant design is in accordance with REA Form 511, "Telephone System Construction Contract," REA TE & CM-630, "Design of Aerial Cable Plant," and Addendum No. 2 to REA TE & CM-690, "Joint Use of Poles," and that the staking of the pole lines has been completed in accordance with REA TE & CM-626, "Staking," and complying with data in REA TE & CM-636, "Aerial Cable Plant Assembly Units."

1.05 Information on the staking sheets will include class and length of each pole; the location of each pole, anchor and terminal; the tree trimming required; the cable sizes in numbers of pairs; the gauge of conductors; the beginning and end of each size for each section of the cable; the strand size for each size of cable; the required separation between telephone cable and power attachments on all poles in joint use; and loading point locations.

1.06 If conditions require any deviation from the staking sheet data, the engineer shall be notified and work out a satisfactory solution for the construction forces. Such changes shall be posted on the staking sheets which become the permanent record of the construction.

1.07 REA Form 511, section "g" contains certain cable plant construction specifications. Section "u" includes drawings of cable plant Assembly Units. Section "x" includes Guide Drawings of construction details.

?. HANDLI.. AND STORAGE OF SUSPENSION STRAND

2.01 Proper handling and storage of telephone suspension strand will
ıt accelerated corrosion or physical damage. Improper
.ng or storage may decrease the normally expected service
ınd may also create construction problems. The storage
ls suggested in REA TE & CM-616, "Construction of Bare
Wire Plant," should be followed.

a section of line before strand

imum practicable length should be
th of one pull depends on the

(a) Changes in grade.
(b) Interference from trees, wires and other cables.
(c) The number of corners and the corner angles.

3.03 Suspension strand usually will be supplied on a reel. The strand may be run out in one of the following ways:

3.031 Along the ground where no obstructions exist such as cables, guys, wires or trees which would interfere with raising the strand up to the suspension clamps on the poles.

3.032 Through the strand groove of the suspension clamps. The clamp nuts should be tightened only enough to hold the strand in the clamp groove and not tight enough to bind the strand during pull-in or tensioning.

3.033 Over the nut which is between the clamp and the pole. The strand should be placed in the clamp groove at about every fifth or sixth pole in straight sections of line and also where there is a high point or a dip. The clamps where the strand is placed in the groove should have the clamp nuts tightened as stated in paragraph 3.032.

3.034 Over drive hooks or nails driven into the poles at or below the expected height of the cable through bolts. This method may be necessary in joint-use construction for temporary clearance reasons stated in paragraph 3.11. If hooks are used, they should be driven well into the poles leaving only space enough between the hooks and the pole to permit slipping the strand in the hook. As stated in paragraph 3.033, the cable should be placed in clamps at about every fifth or sixth pole. The hooks should be removed after the through bolts have been placed and the strand has been placed in the clamps.

3.04 Where it is necessary to place strand above power secondary wires (not primaries), above guys to a power line on separate poles, or over highways, the method shown in Figure 1 can be employed. With this method the rope between the poles should remain to support the strand until it has been tensioned and dead-ended.

3.05 Where there is a possibility of the strand whipping up into contact with the power wires during stringing or tensioning, the strand should be held down by 3/8-inch or larger ropes.

3.07 To permit the pay-out of strand the reel of strand can be placed on a pay-out frame shown in Figure 2; on a strand reel jack; on a strand reel hanger; or on cable reel jacks.

3.08 Strand can be cut with a strand cutter or hacksaw. To prevent the strand wires from spreading and to avoid flying of metal particles a double layer of friction tape should be wrapped around the strand for a length of two or three inches and then the cut should be made at the mid-point along the tape.

3.09 Factory splices in strand are marked by a band of paint. Such splices should not be bent around strand connectors, eye bolts or at small radius bends.

3.10 Where a cable diminishes in size and a smaller size of strand could be used for the smaller cable it is more practical to continue the larger strand rather than make a strand connection, if the extension beyond the diminishing point is 1000 feet or less. A false dead-end should be placed on the larger strand and guyed as shown on Guide Drawing 211 in REA Form 511.

3.11 Addendum No. 2 to REA TE & CM-690 explains the conditions under which strand must be placed in temporary locations on joint poles before cable is placed in order to prevent the small initial strand sag permitting the strand to contact the power wires.

4. STRAND SPLICES

4.01 Two methods are available for splicing suspension strands. One method uses guy clamps and strand connectors. Guy clamp use is shown on Guide Drawing 204 in REA Form 511, but the drawing states that an "equivalent device rated to develop the strength of the appropriate suspension strand" can be used. Approved devices are available in sizes for splicing two strands of the same size and for splicing a 6M to a 10M strand or a 10M to a 16M strand. These devices are preferred to the clamp method because they do not necessitate cutting and clamping the lashing wire at a strand splice and are more economical from the strand
erial and labor costs.

of strand tensioning the temperature should not be
ect sunlight. Hot sun on strand will increase the
rature above that in adjacent shade. The tension

required for the shade temperature, if applied to the strand at a hotter temperature, will result in some tension increase when the strand cools but this is unimportant.

5.02 The initial strand tension required depends on the size of the strand, the temperature at which it is tensioned and on the average span length involved. The initial 60° F. tension used for all span lengths in all three storm loading districts for 6M strand is 1100 pounds, for 10M it is 2100 pounds and for 16M it is 3600 pounds. For stringing at any temperature other than 60° F. the tensions will differ from the above stated values.

5.03 There is a definite tension for each of the three strand sizes for each average span length at each temperature. Tension data for various temperatures and average span lengths are given in Tables 1, 2, and 3 for 6M, 10M, and 16M strands, respectively.

5.04 The use of a dynamometer is recommended rather than sag measurements in strand tensioning because strand sag is difficult to measure accurately. The shunt type dynamometer is more useful than the tension type because it also can be used to test the tension after the strand is bolted in place. Figure 3 shows how dynamometer measurements are made. Figure 4 shows where tension readings should be made. The oscillation method for determining strand tension is not recommended.

5.05 Strand can be tensioned using a strand puller attached to a winch line as shown in Figure 3 or by block and tackle. Tension should be applied slowly while the entire length of strand being pulled is observed for evidence of snagging or failure to slip through its temporary attachments at poles. The strand puller jaws should be kept free of oil or grease to prevent slippage.

5.06 The strand shall be anchored at a dead-end pole before the first section of strand is tensioned and terminated preferably by the use of one of the types of boltless guy clamps (items P u-2 in the "List of Materials Acceptable for Use in Telephone Systems of REA Borrowers".) Successive pulls can be made from the end of the first pull. If there is a possibility that the strand and cable may be extended beyond a dead-end pole a three-foot tail should be left which will permit strand extension using a strand sleeve. Elsewhere a six-inch tail is sufficient. The tail ends should be served using stainless steel lashing wire or held by a guy wire clip (item dz in the "List of Materials").

Clips are available in three sizes to fit 6M, 10M, and 16M strands.

5.07 The use of dampers to protect the strand from fatigue failure is required if the cable is not to be placed immediately. For this purpose a piece of No. 14 bridle wire shall be placed along the top of the suspension clamp and wrapped around the strand extending two feet in both directions with the ends snubbed.

6. CABLE PLACING AND LASHING

6.01 Direct lashing of a cable to a strand can be accomplished as shown in Figure 5. Also, cable can be placed by using temporary supports, either cable blocks or temporary rings, through which the cable is pulled from a stationary reel after which it is lashed.

6.02 Moving Reel Method. If the terrain is suitable this is the most desirable method and is a faster method than the stationary reel method. It is practicable if the cable reel trailer and its towing vehicle can move along the side of the pole line on which cable is to be placed provided there are no obstructions such as trees, guys, etc., which would prevent raising the cable to the strand.

6.03 Stationary Reel Method. The methods of supporting cable during this operation can be one of the following:

6.031 Cable block method.
6.032 Sliding ring method.
6.033 Temporary ring method.

These methods are shown in Figure 6. The supports shall be close enough together to prevent excessive bending of the cable between supports. Cable made under REA Specification PE-22 for "Fully Color-Coded, Polyethylene-Insulated, Polyethylene-Jacketed Telephone Cables," has a corrugated metal shield under the jacket. This shield will be damaged if the cable is permitted to bend excessively.

6.04 The cable block method requires the use of a tree pruner handle to place the blocks and lock them to the strand. A lifter is required with the pruner handle. A cable block pusher is a 3 foot tube designed for placing over the strand to push the blocks ahead of the lashing machine. The blocks are lifted off at the poles and lowered by hand line. Blocks are placed at various spacings depending on the cable weight. The following table is a guide:

Cable Weight, (Pounds per foot)	Maximum Block Spacing
1.0 or less	35 feet
1.5	33 feet
2.0	25 feet
2.5	20 feet
3.0	16 feet
3.5	14 feet

6.05 Line wire should not be used for pulling in cable where blocks are used because it may bind in the blocks. Wire rope (1/4 or 3/16) inch, a winch line, 2200 pound strand or manila rope (1/2 inch diameter or larger) are preferable to line wire. Rope should be used in cable placing in joint use to prevent electrical hazards that result if metal rope or strand is used which can flip up into power wires.

6.06 A typical cable lashing machine in use is shown in Figure 7. There are several types of lashing machines. One type will lash cables not exceeding 1-5/8 inches in diameter. Another type will lash cables as large as 3-1/4 inches in diameter. Some lashers for 1-5/8 inch cable will hold two 1200 foot reels of 0.045 inch diameter stainless steel lashing wire. A lasher for the larger cables uses reels of 0.061 inch diameter stainless steel lashing wire. All types of lashers wrap the lashing wire counter clockwise around the cable and strand. Where grades are involved it is preferable to lash downhill.

6.07 Two kinds of lashing wire clamps are necessary in lashing cable to strand. One is a temporary clamp having a wooden handle for opening and closing the clamp jaws and the other is the permanent clamp. The temporary clamp is removed after the permanent clamp is placed. Figures 5 and 7 show how the temporary clamp is used. Guide Drawings 241, 242, and 243 of REA Form 511 show how lashing wire is clamped in various situations. Lashing wire shall be clamped at each side of each pole.

6.08 When cable, either paper or plastic insulated is lashed at temperatures below 30° F. it should be tensioned more than is usual at higher temperatures. This will tend to prevent bowing in hot weather by causing the cable to be lashed snugly against the strand.

6.09 Lashing wires shall be spliced using approved types of stainless steel compression sleeves of appropriate sizes. Stainless steel lashing wire of .045 and .061 inch diameter are approved for use.

6.10 Lashing Two Cables to Same Strand

6.101 Due to changing requirements of service and materials, or other reasons, it may be necessary to lash two cables to the same strand. A new cable may be lashed over an existing cable to the same strand. The combined diameters of the two cables cannot exceed the diameter for which the particular lasher was designed.

6.102 In order to promote firm lashing, the diameter of one cable should not be more than twice the diameter of the other cable.

6.103 If the diameter of the two cables exceeds two inches, two nuts shall be placed between the suspension clamp and washer to provide clearance between pole and cable.

6.104 If the existing cable is lashed to the strand the lashing wire should be examined carefully, and if it is found to be severely corroded, pitted, or broken, or if it has sharp points or edges which would damage the new cable, it should be removed. However, it is generally not necessary to remove existing lashing wire.

7. SAG AND TENSION AFTER CABLE IS PLACED

7.01 The sag and tension in a strand and cable after the cable is placed depends on the temperature, the strand size, the weight of the cable per foot, and the span length. This is called the "initial" cable sag and tension. If it ever is necessary to check the tension in a strand after a cable is placed, a shunt type dynamometer can be used.

8. LONG SPANS, RAILROAD CROSSINGS AND OTHER SPECIAL CONSTRUCTION

8.01 For special construction such as at heavy grades, slack spans, large angles, railroad crossings, etc., see Figure 8.

8.02 For railroad crossing construction details see REA TE & CM-617, "Railroad Crossing Specifications."

CENTRAL OFFICE ENTRANCE CABLES

9.01 The central office cable entrance specified may be aerial, buried, or in underground conduit. The plan will be detailed by the engineer. If splices between tip and entrance cables

are required beneath the floor, the splice closures must be completely moisture proof because splicing pits under floor troughs and splicing vaults tend to be damp.

9.02 Sheaths of lead-covered cables and shields of polyethylene-jacketed cables shall be bonded from the central office splice to the central office ground as required by REA TE & CM-810, "Central Office Protection."

10. CABLE SPLICING

10.01 Splicing of lead-sheathed cable can be performed using lead sleeves "wiped" to the sheath. This method is described in REA PC-1, "Splicing Standard for Joining Paper or Pulp-Insulated, Lead-Sheathed Cable to Paper or Pulp-Insulated Cable." However, cast aluminum splice cases for splice enclosures usually will be specified.

10.02 Splice cases should be used for splice enclosures on plastic-sheathed cable having either paper, pulp, or polyethylene-insulated conductors. The cases also can be used for splices of lead cable to plastic-sheathed cable.

10.03 Splicing of polyethylene-insulated conductor cables should be performed in accordance with PC-2, "REA Standard for Splicing and Terminating Plastic-Insulated, Plastic-Jacketed Cables Used on Telephone Systems of REA Borrowers." Ready-access enclosures are used for these splices.

10.04 Experience indicates that tension splicing at low temperatures is not necessary on lashed plastic-insulated, plastic-sheathed cable. It should be considered in splicing heavy lead cable at temperatures below 30° F. The method consists of pulling up the cable by an amount approximating its shrinkage at the low temperature from its length at 60° F. Data for determining this amount is given in a table on Figure 9. This figure shows the suggested method. Tension splicing should have the approval of the engineer.

10.05 When a cable is to be opened in cold weather for such work as splicing to branch cable or placing a terminal, the method shown on Figure 10 is suggested. This loosens the core so that pairs can be located and identified. Without this slack the core may be so tight that the pairs cannot be separated enough to permit identification of desired pairs.

11. CABLE TERMINALS

11.01 Terminals for use where ready-access enclosures are not applicable should be either of two strand mounted arrangements. For terminating 11 or 16 cable pairs, one splice case is paired with and bolted to a "terminal, aerial cable." For terminating 26 pairs, two "terminals, aerial cable" are paired and bolted together. Each "terminal" comprises a terminal box permanently attached to the side of a splice case with the wires from the terminal lugs entering the splice case through a sealed hole. These terminals can be used to enclose a splice in addition to providing for drop wire connections to the terminal lugs. Drop and bridle wires enter the terminals through self-sealing plastic grommets in the bottom of the box.

11.02 Ready-access enclosures, in addition to being used for splice enclosures, provide for mounting one to four six-pair terminal blocks for splicing to a cable conductor. Drop and bridle wires enter through slits in the bottom of the neoprene case.

11.03 The cable layout map will show the pair numbers to be terminated at each terminal enclosure and the pair numbers which are to be spliced to each branch cable.

12. CABLE LOADING

12.01 Loading coils in cases having paper-insulated stubs should be specified for use with paper or pulp-insulated cable; with plastic-insulated stubs for use with plastic-insulated cable; encapsulated, for use in ready-access enclosures on plastic-insulated cable; or in fiber cases for use in splice cases or lead sleeve splices, where moisture is excluded. The cable layout map will show the pair numbers to be loaded at each loading point.

13. CABLE POLE STEPPING

13.01 Poles shall be stepped where called for on staking sheets, with steps placed as shown on Assembly Unit Drawing PM-5 in REA Form 511.

14. MECHANICAL PROTECTION OF AERIAL CABLE

14.01 Mechanical protection of cable from chafing by trees or poles is required. The more usual places where such protection will be needed are shown on Figures 11 and 12. These situations

may not always be known in advance of construction by the engineer and, therefore, the construction forces should request instructions from the engineer. Longitudinally split cable guards of plastic are available, 8 inches long and of various diameters. Cable guards of plastic spirally cut are available in various diameters and lengths.

15. PREVENTION OF CABLE DANCING

15.01 In areas where high winds prevail, cable dancing may occur and can be minimized on a lashed aerial cable by spiraling the cable around the strand. This will present an irregular configuration of cable and strand to the wind pressures, thereby tending to break up movement of cable and reduce dancing. This method may be used on lead-sheathed cables and on plastic-sheathed cables of all sizes.

15.02 Where cable dancing or evidence of dancing has been observed, the engineer will specify on the cable layout map where the cable should be spiraled around the strand as indicated on Guide Drawing 250 in Form 511.

15.03 Two adjacent spans are spiraled at the same time by performing the operation at alternate poles throughout the length of the affected section of the cable lead. The spiraling operation will not be affected by the presence of straight splices.

15.04 Prior to spiraling, it will be necessary to loosen the lashing wire clamps temporarily so that the lashing wire will not tighten unnecessarily. After the spiraling, the lashing wire should be

15.05 If necessary, the s
poles where there a
that care is exerci
stub and splice.

15.06 In areas where high
is constructed on u
require additional
factory results. T
layout map the numb

16. PRECAUTIONS

16.01 This document does not provide all of the construction practices required in erecting poles, placing strand, placing cable and cable splicing. Certain actions are mentioned below which are worthy of special mention herein whether the construction work is done by contract or by force account procedure.

16.02 Strand cutting can be dangerous and should be done as suggested in paragraph 3.08.

16.03 Strand that has been tensioned and on which cable is not to be placed immediately requires the use of temporary vibration dampers to prevent fatigue failure. See paragraph 5.07.

16.04 Strand that has a broken wire should be considered too dangerous to ride in a cable car, to attach a cable splicer's platform or to permit workmen to place a ladder against for working aloft.

16.05 Strand placed on joint-use poles should be kept grounded at all times during the stringing operations and permanently grounded immediately after stringing.

16.06 The precaution mentioned in paragraph 3.11 shall be observed in placing strand on joint-use poles to prevent its small initial sag causing it to contact power wires above the strand before the cable is placed.

16.07 Rubber gloves which meet ASTM Specification D 120-59T (which have been tested and found free of pinholes) shall be worn by the personnel who string strand on joint use poles. Suitable leather overgloves can be worn over the rubber gloves.

16.08 The REA Telephone Operation Manual contains safety practices which should be consulted before cable construction begins. These are Section 1208, "Safety Practices," Section 1208.1, "Safety Practices, Construction of Telephone Facilities on Joint Use Pole Lines."

Table 1

6M Strand Stringing Tensions at Various Temperatures for Various Average Span Lengths for All Storm Loading Districts Stringing Tension is 1100 Pounds at 60°F

mperature	Average Span Lengths - Feet										
	100	150	200	250	300	350	400	450	500	550	600
	Tension in Pounds										
-30	1757	1737	1714	1688	1650	1615	1579	1534	1492	1458	1425
0	1551	1578	1517	1496	1468	1437	1412	1381	1350	1328	1308
15	1500	1475	1413	1398	1374	1350	1329	1306	1285	1268	1252
30	1329	1321	1308	1299	1282	1262	1251	1235	1218	1208	1197
60	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
90	870	883	903	921	937	952	971	982	993	1004	1016
120	642	681	720	760	798	826	857	877	898	918	937

Table 2

10M Strand Stringing Tensions at Various Temperatures for Various Average Span Lengths for All Storm Loading Districts Stringing Tension is 2100 Pounds at 60°F

emperature	Average Span Lengths - Feet											
	100	150	200	250	300	350	400	500	600	700	800	900
	Tension in Pounds											
-30	2969	2961	2947	2935	2915	3901	2877	2830	2788	2723	2666	2613
0	2694	2690	2682	2676	2658	2644	2624	2591	2551	2512	2468	[illegible]
15	2549	2543	2535	2529	2518	2504	2493	2466	2437	2408	2371	[illegible]
30	2405	2399	2391	2389	2377	2375	2360	2341	2322	2300	2280	
60	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	
90	1781	1789	1795	1809	1821	1827	1839	1863	1888	1912	1932	
120	1455	1469	1490	1514	1544	1571	1589	1645	1693	1738	1772	

Table 3

16M Strand Stringing Tensions at Various Temperatures
for Various Average Span Lengths for All Storm Loading Districts
Stringing Tension is 3600 Pounds at 60°F

	Average Span Lengths - Feet							
	200	300	350	400	500	600	700	800
Temperature	Tension in Pounds							
30	4811	4789	4773	4747	4704	4652	4585	4536
0	4432	4406	4392	4381	4348	4306	4267	4218
15	4236	4210	4200	4189	4161	4128	4085	4059
30	4022	4007	3999	3990	3975	3950	3929	3903
60	3600	3600	3600	3600	3600	3600	3600	3600
90	3152	3175	3181	3196	3222	3250	3280	3308
120	2691	2740	2768	2795	2852	2910	2968	3022

Note: Data from copyrighted Data Sheets, by permission of Indiana Steel and Wire Company.

The strand stringing tensions given in Tables 1, 2, and 3 are for average span lengths in a section of line. When strung and tensioned at other than 60°F the tensions will approximate the values given for 60°F when that temperature occurs before the cable is placed. Flexibility of supports allow sags to decrease in the shorter spans and increase in the longer spans in any section of line between deadends but the tensions will be relatively uniform along that section.

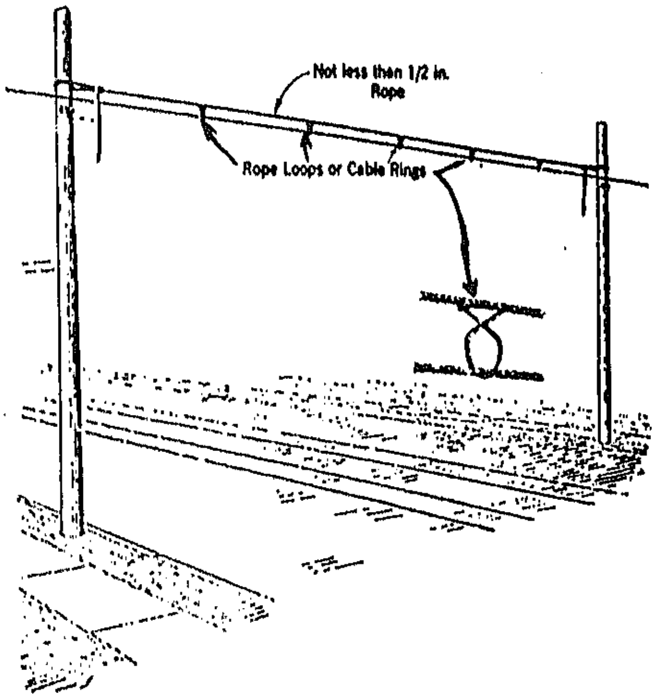


Figure 1

STRAND PAY-OUT FRAME

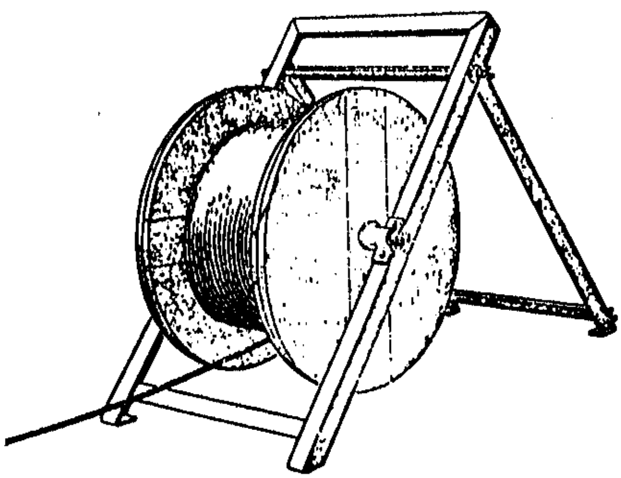


Figure 2

STRAND DYNAMOMETERS.

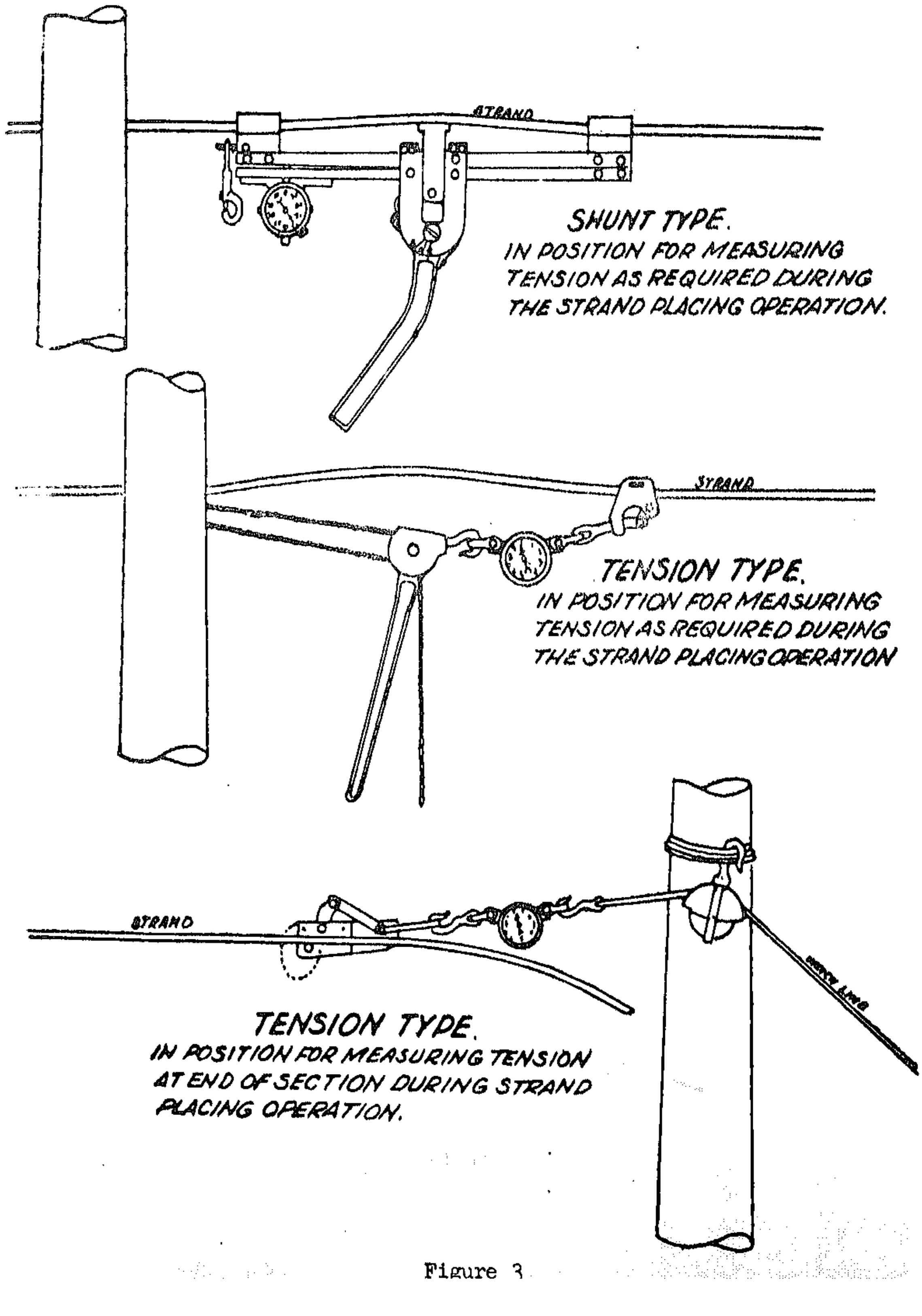
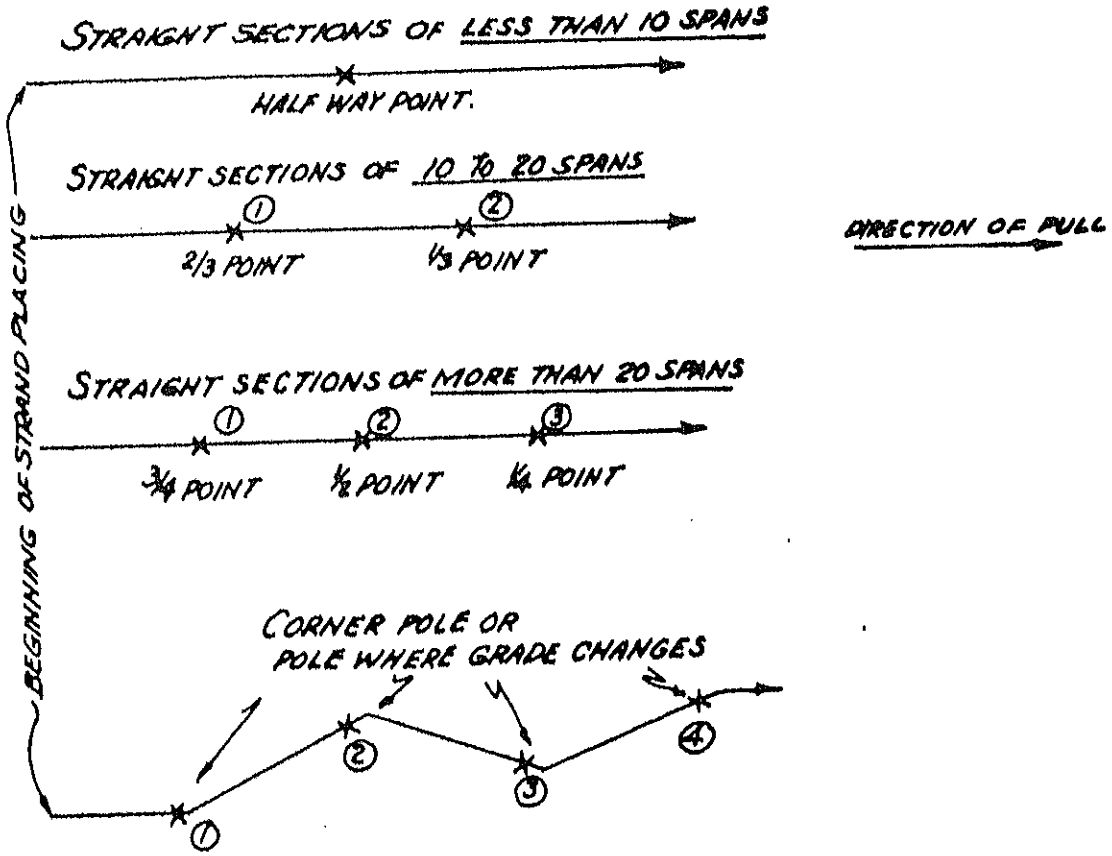


Figure 3

SELECTION OF POINTS FOR READING AND EQUALIZING STRAND TENSIONS.

① INDICATES SEQUENCE OF PROCEEDURE
X INDICATES POINT OF TENSION EQUALIZATION.
READING IS GENERALLY TAKEN NEAR A POLE.



GENERAL NOTE:
IN INITIAL PLACING OF STRAND THE CABLE SUSPENSION CLAMPS SHOULD BE FREE ENOUGH TO ALLOW THE STRAND TO SLIDE THRU
IT SHALL FIRST BE PULLED UP UNTIL IT IS SOMEWHAT TIGNTER THAN THE REQUIRED TENSION.
IT SHALL THEN BE EASED OFF AS THE TENSION IS EQUALIZED AT THE ABOVE POINTS, AFTER WHICH THE CLAMPS SHALL BE PERMANENTLY TIGHTENED.

WHEN THE ABOVE PROCEEDURE IS FOLLOWED, IT WILL CONTRIBUTE TO THE REDUCTION OF CABLE DANCING.

LASHING CABLE DIRECTLY FROM MOVING REEL

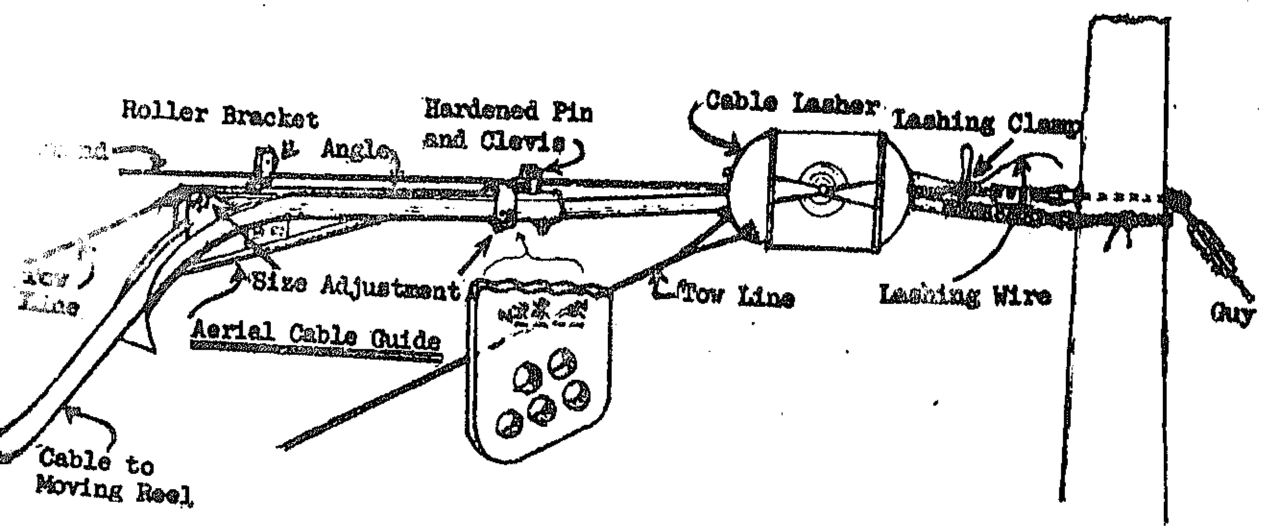
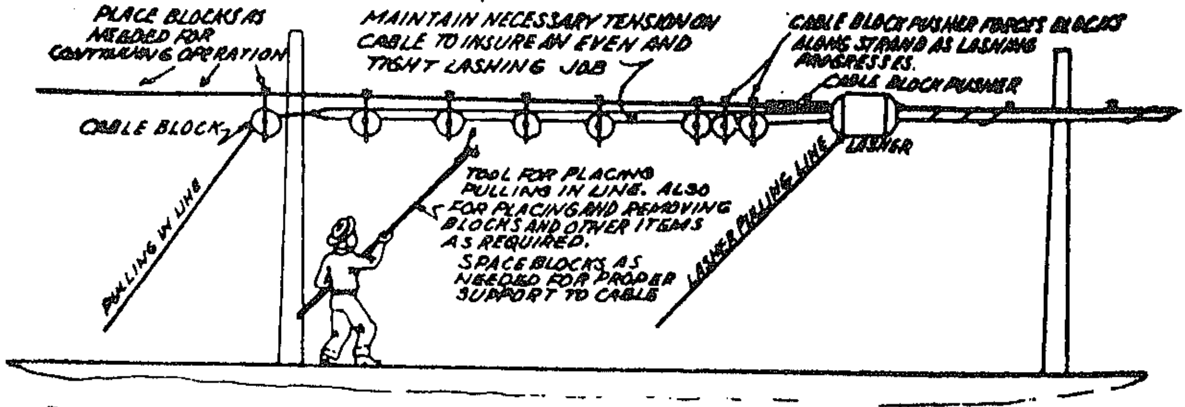


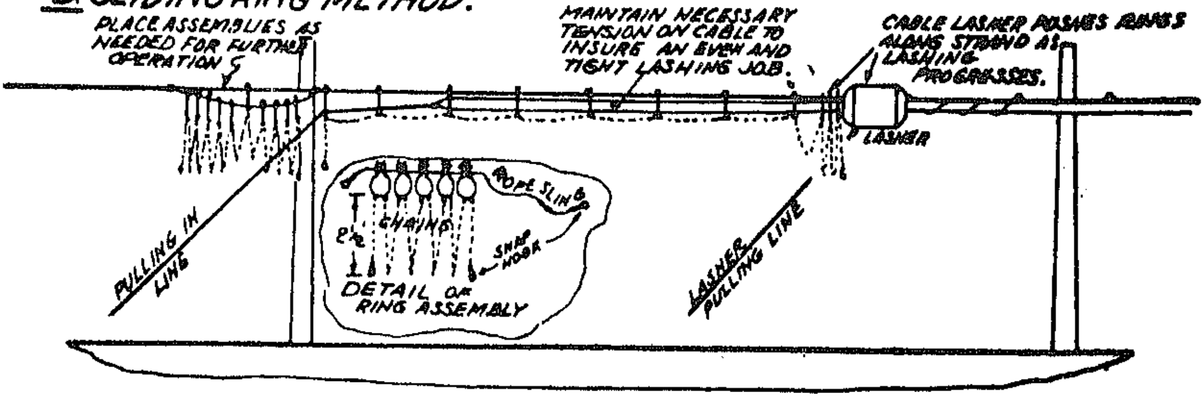
Figure 5

TEMPORARY METHODS OF SUPPORTING CABLE FOR LASHING OPERATION

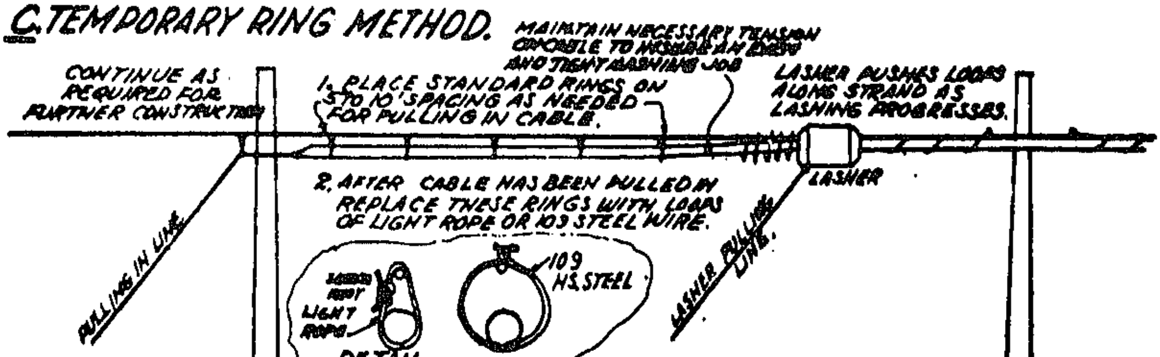
A. CABLE BLOCK METHOD.



B. SLIDING RING METHOD.



C. TEMPORARY RING METHOD.

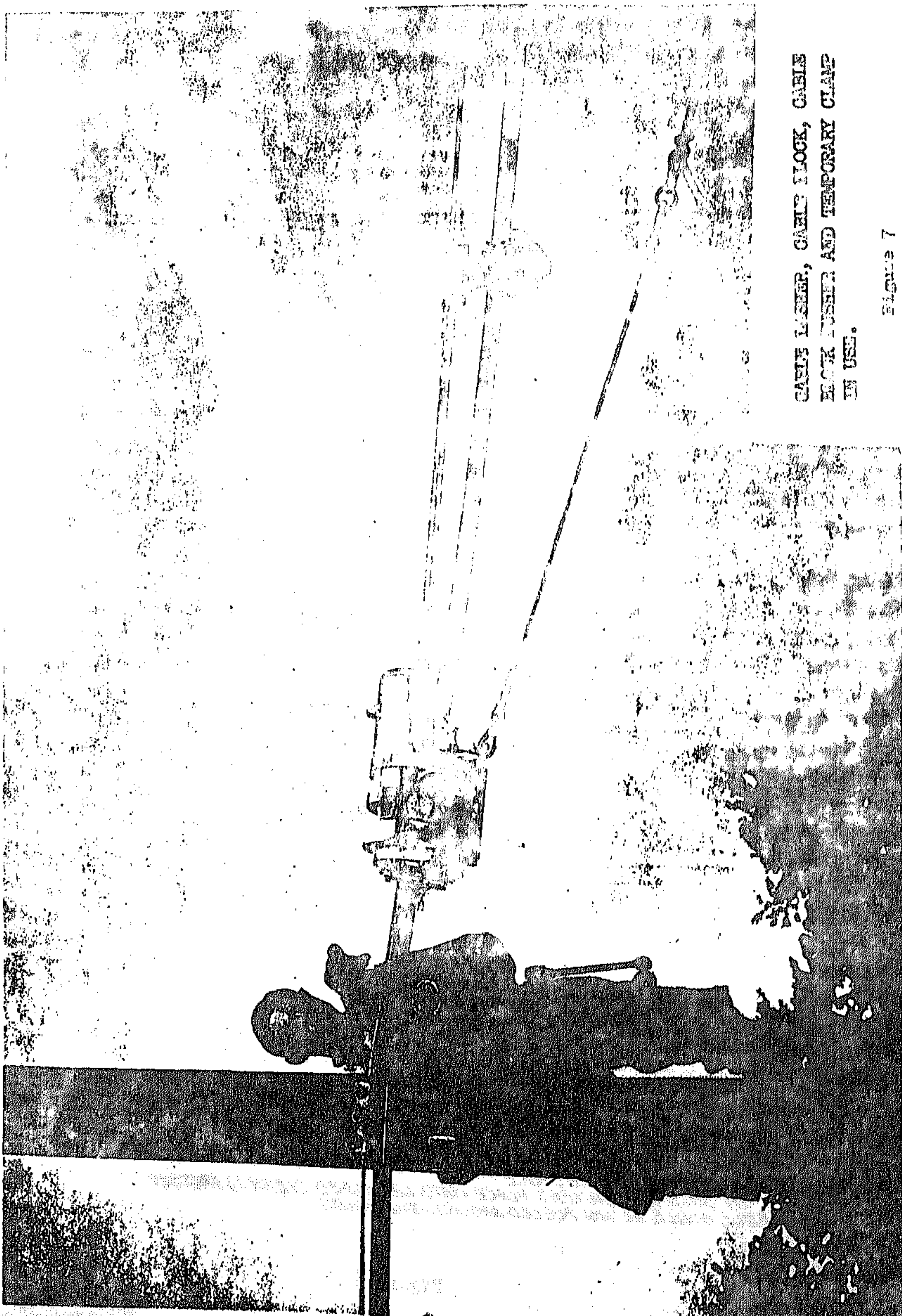


GENERAL NOTE: ON CHANGES IN GRADE AND ON HEAVY CORNERS TAKE NECESSARY STEPS TO PREVENT CABLE FROM RIDING OUT OF BLOCKS OR UPSETTING OTHER SUPPORTS.

ON INSIDE CORNERS PLACE SHEAVE BLOCKS AS NEEDED TO MAKE A SMOOTH AND EVEN BENDING OF THE CABLE.

ON OUTSIDE CORNERS PLACE MATS OR FOLDED CLOTH TO PROTECT THE CABLE WHILE BEING PULLED AROUND THE POLES.

Figure 6



CABLE LASHER, CABLE BLOCK, CABLE BLOCK PUSHER AND TEMPORARY CLAMP IN USE.

Figure 7

- SPECIAL CONSTRUCTION -
GENERAL FEATURES AND FALSE DEAD ENDS

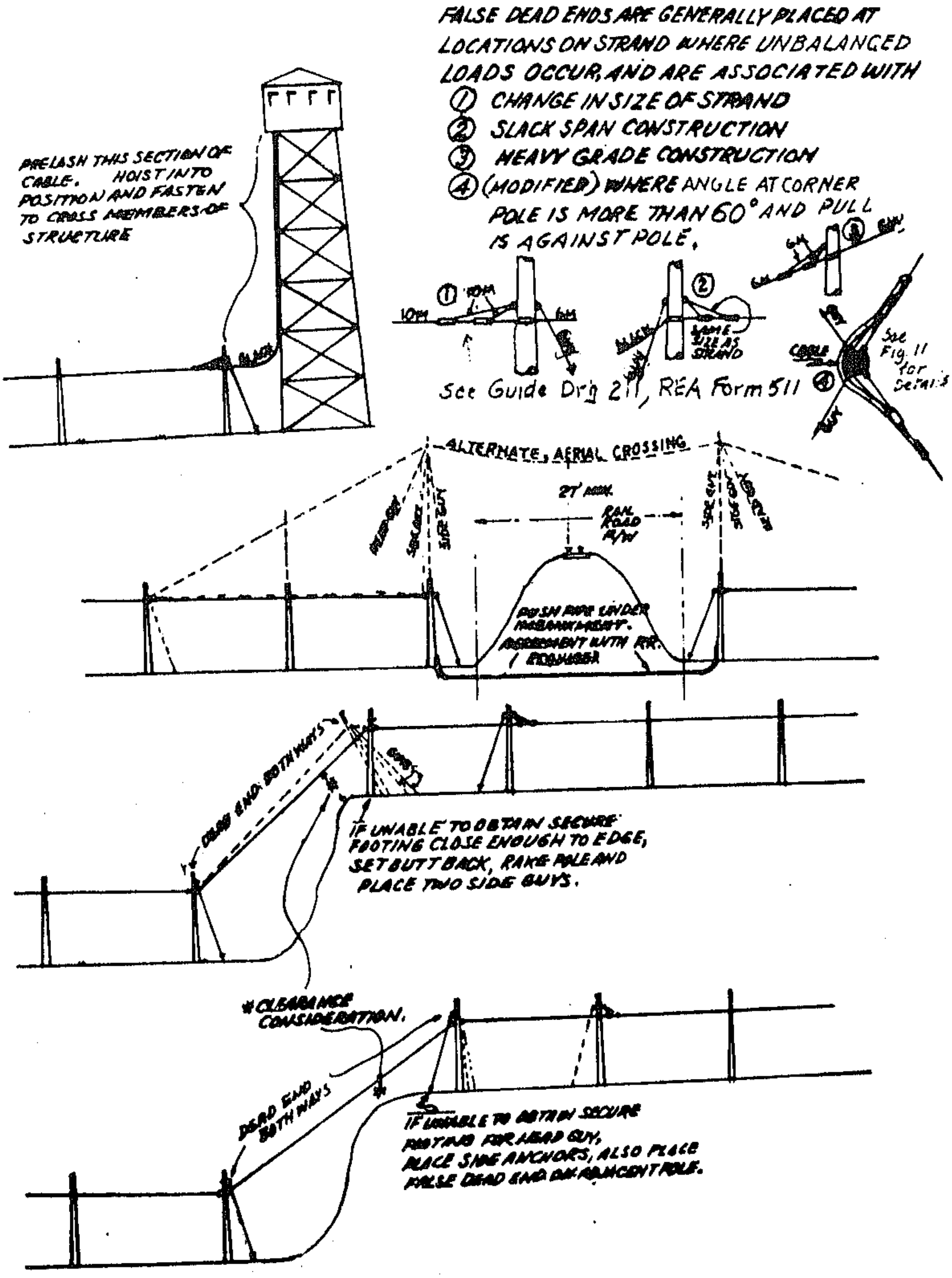
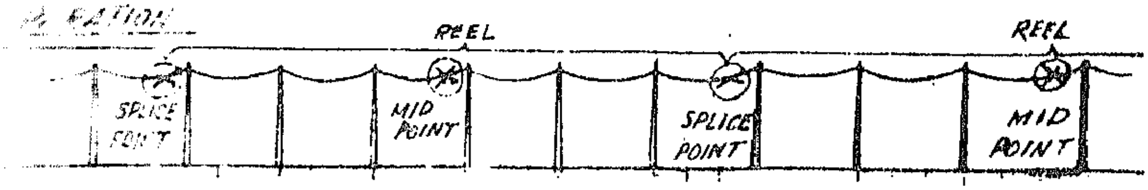


Figure 8

— LEAD SHEATHED CABLES —

TENSION SPLICING FOR LASHED CABLES WEIGHING
? POUNDS PER FOOT) OR MORE WHEN TEMPERATURE
IS 30° OR LESS.
ENGINEER SHALL BE CONSULTED AS TO PROCEDURE

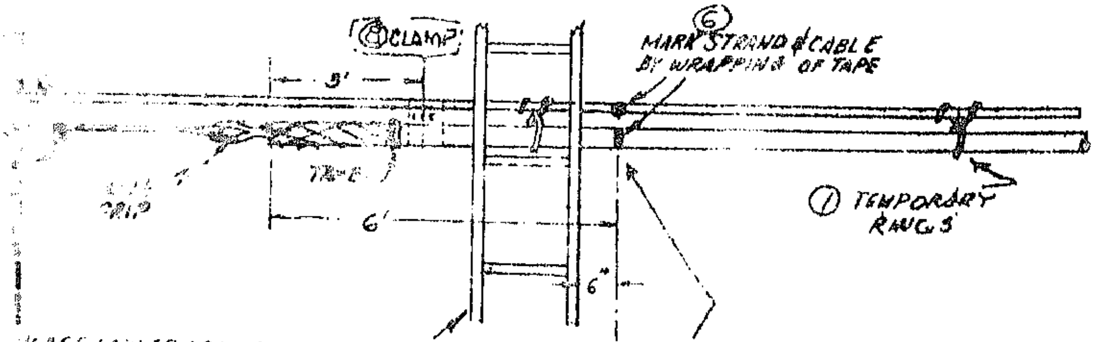


...CABLE INTO TEMPORARY RINGS SPACED APPROXIMATELY 5 FT. APART.

...URE CABLE TO STRAND AT MID POINT (GRADE CLAMP MAY BE USED).

PLACE BLOCKS OR MATS AT CORNERS AS MAY BE REQUIRED.

AFTER PULLING IN KEEP ENOUGH TENSION ON CABLE TO PREVENT SAGGING BETWEEN THE TEMPORARY RINGS.



(5) PLACE LADDER AGAINST STRAND

(6) MARK STRAND AND CABLE

(7) PULL UP CABLE UNTIL MARKS ON STRAND AND CABLE ARE SEPARATED TO EQUAL STRETCH INDICATED FOR TEMPERATURE OBSERVED AT START OF WORK. SEE TABLE BELOW.

AVERAGE SPAN LENGTH	CABLE STRETCH IN 32 NDS OF AN INCH FOR 100 FT OF CABLE TENSIONED AT TEMPERATURES (FAHRENHEIT) INDICATED							
	-20	-10	0	10	20	30	40	50
200 FT. OR LESS	12	10	7	5	3	2	–	–
201 FT TO 250 FT	16	13	10	8	6	4	–	–
251 FT TO 300 FT	11	9	8	5	3	2		

(8) WHEN THE CABLE IS IN PROPER TENSION CLAMP IT TO THE STRAND ABOUT 3 FT. FROM END OF CABLE. RELEASE PULLING IN LINE AND REMOVE CABLE GRIP. NOTE: GRADE CLAMPS SHALL NOT BE REMOVED UNTIL AFTER CABLE IS SPLICED.

(9) PROCEED WITH LASHING IN USUAL MANNER.

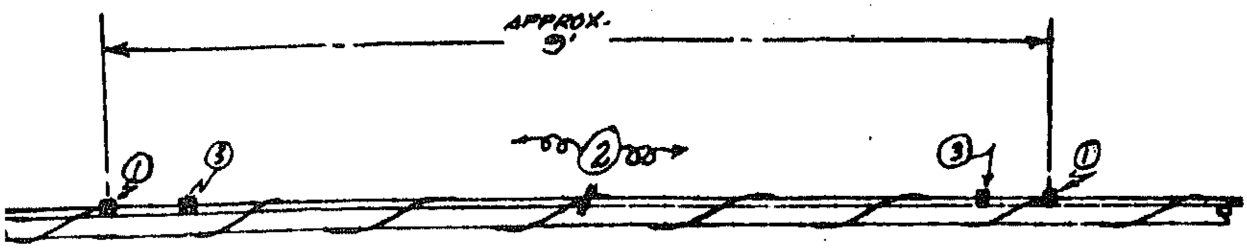
(10) SPLICE CABLE THROUGH. REMOVE CLAMPS ETC. IN SPLICING, KEEP CABLE AS NEAR TO STRAND AS POSSIBLE.

—SMALLER SIZE CABLES—

IN COLD WEATHER, THE USE OF SOME WHAT HIGHER TENSION IN THE CABLE DURING THE LASHING OPERATION AS CABLE IS PLACED, WILL TEND TO MINIMIZE BOWING. ENGINEER SHALL BE CONSULTED AS TO PROCEDURE.

Figure 9

OPENING CABLE IN COLD WEATHER
LASHED CABLE



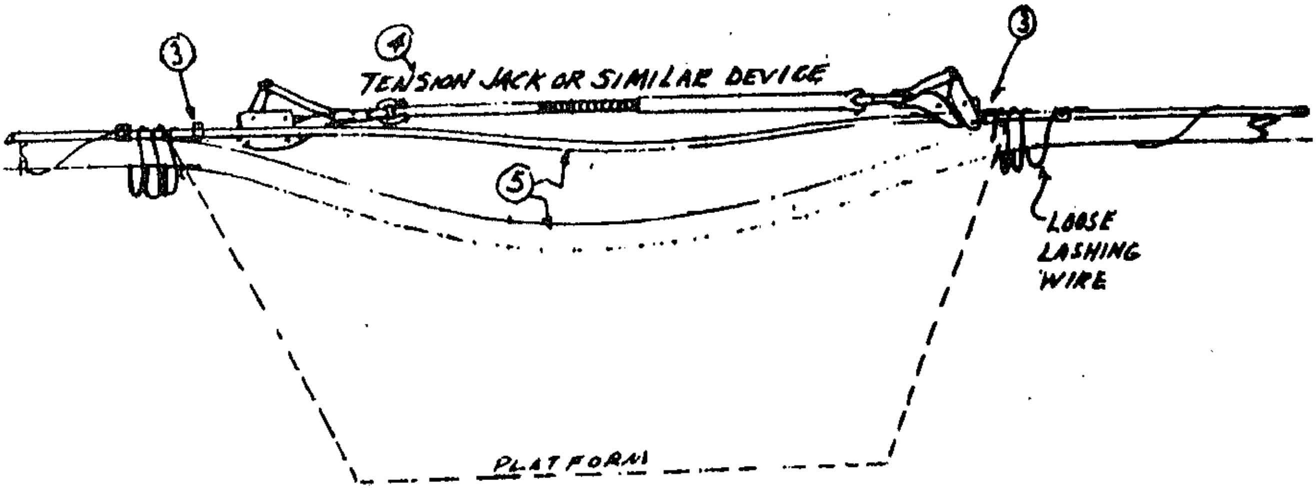
1. SECURE LASHING WIRE TO STRAND

2. CUT LASHING WIRE AT SPLICE LOCATION AND PUSH LOOSE COILS BACK IN EACH DIRECTION TO FASTENING ① ALOWING CABLE TO HANG FREE

3. PLACE ADDITIONAL CLAMP OR BOLT ON STRAND ABOUT 6" FROM FASTENING ① IN ORDER TO PREVENT PLATFORM HOOKS FROM SLIPPING.

4. PLACE TENSION JACK OR SIMILAR DEVICE

5. OPERATE JACK TO INDUCE REQUIRED SLACK IN STRAND AND CABLE IN PREPARATION FOR SPLICING.



6. COMPLETE WIRE WORK, THEN BACK OFF TENSION JACK AND REMOVE IT FROM STRAND.

7. COMPLETE SPLICING WORK, RESTORE LASHING WIRE AND PLACE SUPPORTS AS NEEDED.

NOTE: UNDER SOME CONDITIONS ON SMALLER SIZE CABLES THE USE OF A SLACK PULLER MAY SIMPLIFY THE OPERATION

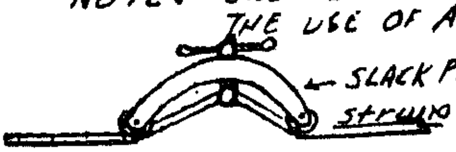
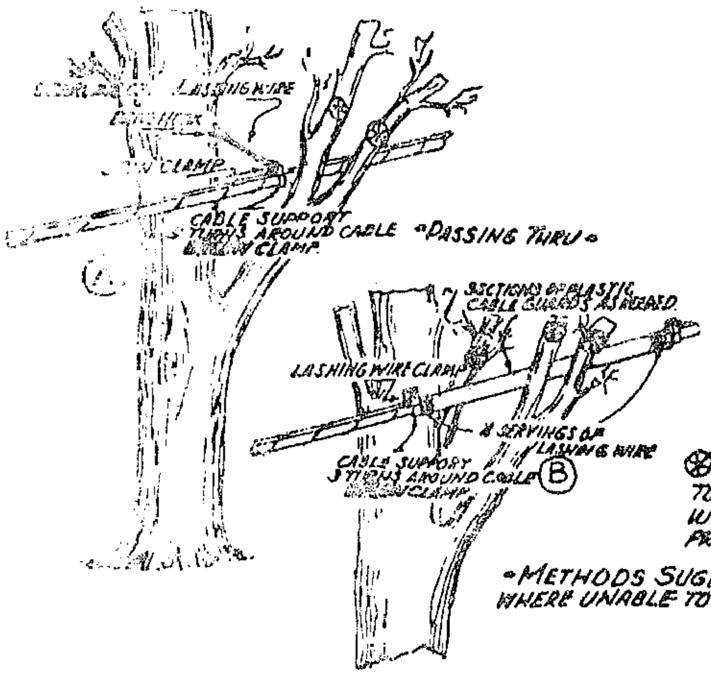


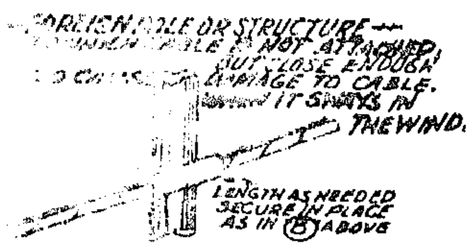
Figure 10

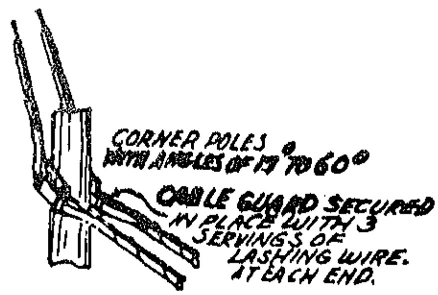
CONSTRUCTION OF AERIAL CABLE
MECHANICAL PROTECTION

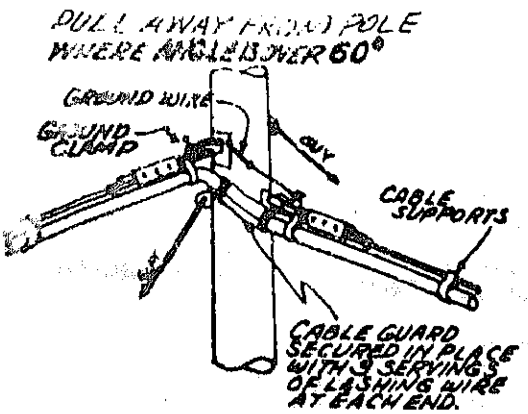


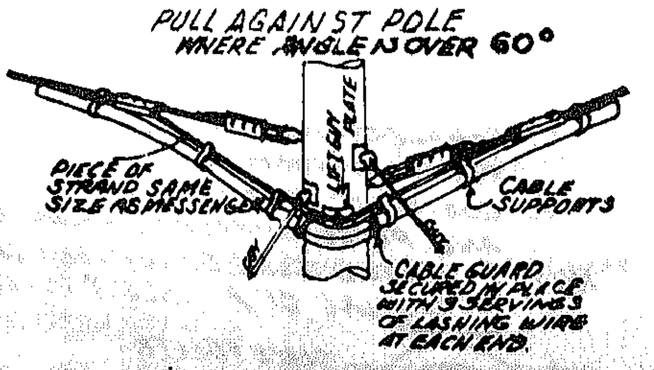
⊛ INDICATES BRANCHES TO BE CLEARED, OR WHERE CABLE NEEDS PROTECTION IN PASSING

"METHODS SUGESTED — WHERE UNABLE TO OBTAIN TRIMMING.









CONSTRUCTION OF AERIAL CABLE
MECHANICAL PROTECTION
PLASTIC CABLE GUARDS

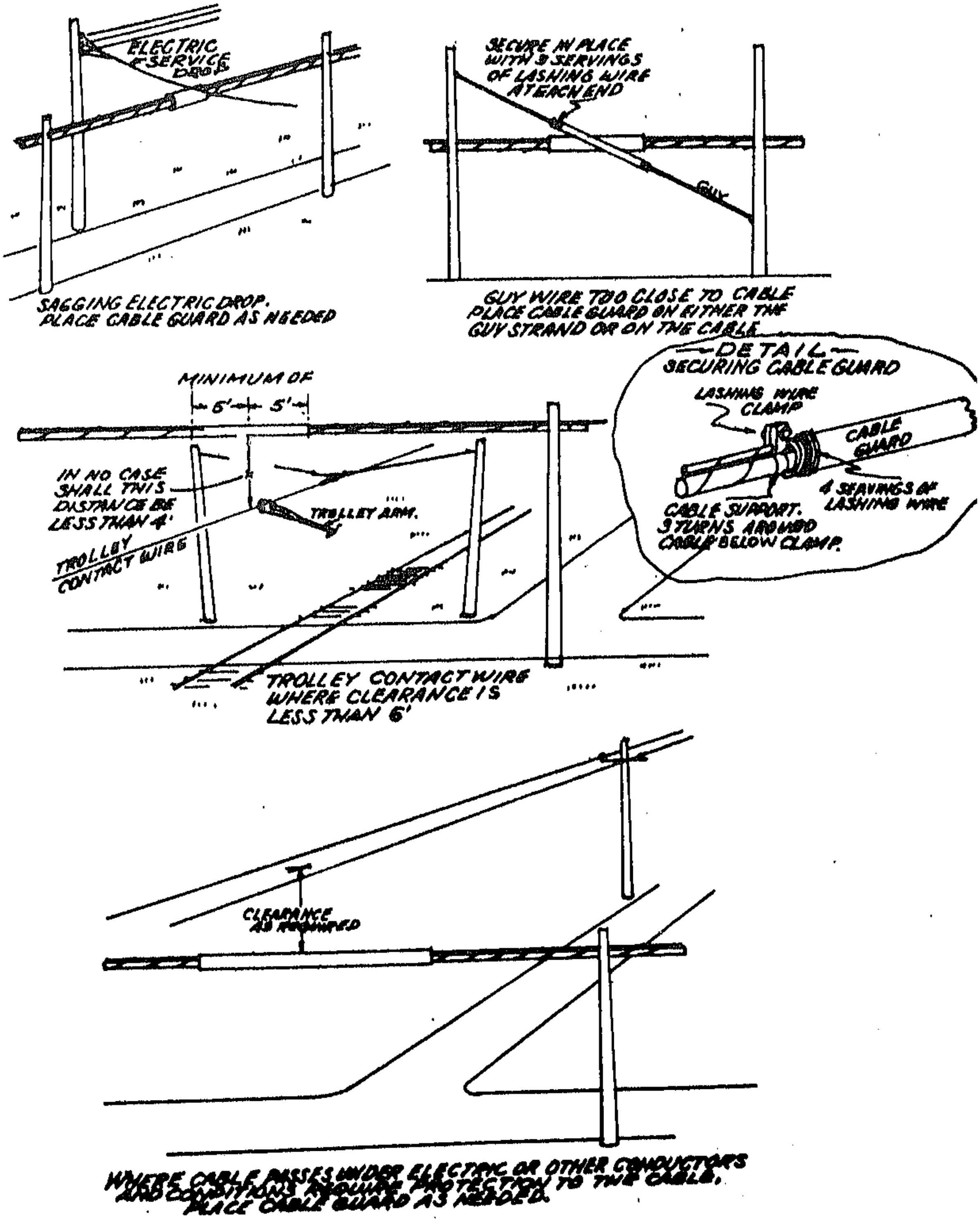


Figure 12